

National Resources Inventory

2001 Annual NRI

Soil Erosion

July 2003

About the Data

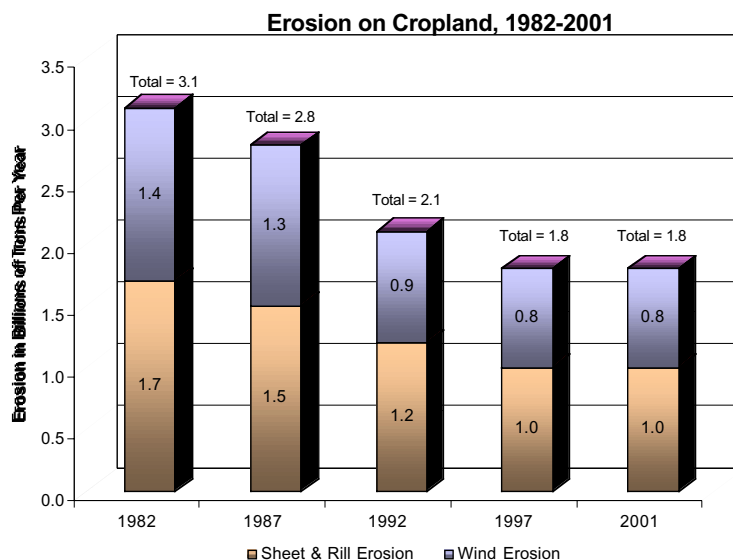
Estimates presented here are based upon the latest information from the National Resources Inventory (NRI). The NRI is a longitudinal sample survey based upon scientific statistical principles and procedures. It is conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), in cooperation with Iowa State University's Center for Survey Statistics and Methodology.

The results are the first available from the new Annual NRI. Previously, NRI data were collected at 800,000 sample sites every 5 years. Now the data are collected every year, but for slightly less than 25 percent of these same sample sites. The 2001 data are suitable only for analysis at a national scale because of this reduced sample size. As additional data are collected each year, (over)

The National Resources Inventory (NRI) is a statistical survey of natural resource conditions and trends on nonfederal land in the United States - nonfederal land includes privately owned lands, tribal and trust lands, and lands controlled by State and local governments. The NRI provides nationally consistent statistical data on erosion resulting from water (sheet and rill) and wind processes on cropland for the period 1982 - 2001. Erosion on cropland is of particular interest because of potential offsite impacts on water and air resources as well as its relationship to productivity and long-term cropland sustainability.

Key Findings

- The significant gains in erosion control that were made between 1982 and 1997 were sustained in the period between 1997 and 2001.
- Soil erosion on cropland declined from 3.1 billion tons per year in 1982 to 1.8 billion tons per year in 2001. Sheet and rill erosion dropped by almost 41 percent during this time period, while wind erosion dropped by 43 percent.
- Erosion rates per acre also declined between 1982 and 2001. Sheet and rill erosion dropped from 4.0 tons per acre per year to 2.7 tons per acre per year, and wind erosion dropped from 3.3 tons per acre per year to 2.1 tons per acre per year.



About the Data, cont.

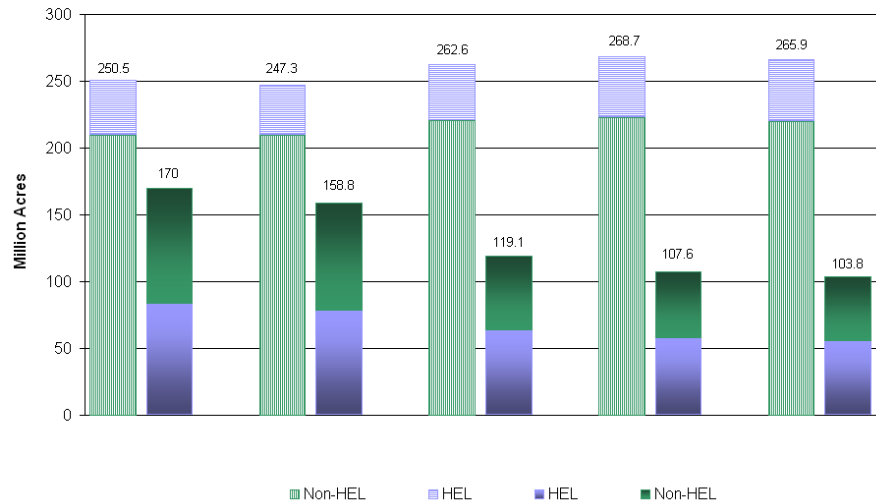
results will become available for regional, state, and sub-state analysis. Current estimates cover the contiguous 48 states. Future estimates will also cover Hawaii, Alaska, the Caribbean, and selected Pacific Basin islands.

The findings presented here cover two types of erosion:

- Sheet and rill erosion - the removal of layers of soil from the land surface by the action of rainfall and runoff; it is the first stage in water erosion.
- Wind erosion - the process of detachment, transport, and deposition of soil by wind.

Erosion rates computed from NRI data are estimates of average annual (or expected) rates based upon long-term climate data, inherent soil and site characteristics, and cropping and management practices. These estimates come from factors that are determined for the (over)

HEL and Non-HEL Cropland by Erosion Category, 1982 - 2001



- Between 1982 and 2001, cropland acreage eroding at excessive rates dropped by 39 percent. In 2001, 103.8 million cropland acres were experiencing excessive erosion, down from 170 million acres in 1982.
- In 2001, about 72 percent of total cropland acres were eroding at or below the soil loss tolerance rate, up from 60 percent in 1982.
- Highly Erodible Land (HEL) cropland acreage declined from 123.9 million acres in 1982 to 101.1 million acres in 2001. The decline occurred in HEL acreage eroding at excessive rates, while HEL acreage eroding at acceptable soil loss tolerance rates increased slightly.
- Gains in erosion control occurred even though cropland acreage has continued to change over time as cropland was retired or converted to other uses and other land uses were converted to cropland.

Importance to the Nation

Erosion is a concern because of its potential offsite effects, for example, in contributing dust to the atmosphere, or delivering sediment, nutrients, and chemicals to water resources.

Soil loss from farm fields at excessive rates can also be a concern as it diminishes soil productivity over time. Some productivity loss can be mitigated through the addition of external inputs, but at an economic cost.

The combination of these effects has implications for natural resource conditions generally, and long-term cropland sustainability.

About the Data, cont.

portion of a field associated with an NRI sample site. The factors are used in two erosion models: 1) the Universal Soil Loss Equation (USLE) and 2) the Wind Erosion Equation (WEQ). The factors for these erosion prediction equations are determined for each NRI sample site that is cropland, pastureland, or land enrolled in the Conservation Reserve Program.

The erosion equation factors are also used to determine an Erodibility Index (EI) for these NRI sample sites. This index is a numerical expression of the potential of a soil to erode, considering climatic factors and the physical and chemical properties of the soil – the higher the index, the greater is the investment needed to maintain the sustainability of the soil resource base if intensively cropped. Highly Erodible Land (HEL) is defined to have an EI of at least 8. (*over*)

More Information

For more information about the NRI, visit <http://www.nrcs.usda.gov/technical/NRI/>

See the 2001 Annual NRI Glossary for definitions of key terms:
<http://www.nrcs.usda.gov/technical/land/nri01/glossary.html>

To obtain State and local 1997 NRI data, contact your NRI coordinator. Links to State NRI websites and contact information can be found at:
http://www.nrcs.usda.gov/technical/NRI/1997/obtain_data.html

Send comments and questions to nri@nhq.nrcs.usda.gov

Sheet and Rill Erosion on Cropland

Year	Million Tons per Year	Tons per Acre per Year
1982	1,680.1 ± 13.8	4.0 ± 0.1
1987	1,486.4 ± 12.8	3.7 ± 0.1
1992	1,182.0 ± 10.9	3.1 ± 0.1
1997	1,048.5 ± 9.3	2.8 ± 0.1
2001	997.2 ± 13.7	2.7 ± 0.1

Wind Erosion on Cropland

Year	Million Tons per Year	Tons per Acre per Year
1982	1,389.2 ± 22.0	3.3 ± 0.1
1987	1,307.9 ± 22.0	3.2 ± 0.1
1992	919.6 ± 20.4	2.4 ± 0.1
1997	812.6 ± 18.2	2.2 ± 0.1
2001	789.8 ± 28.5	2.1 ± 0.2

About the Data, cont.

The NRI approach to conducting inventories facilitates examining trends in erosion over time because –

- the same sample sites have been studied since 1982,
- the same data have been collected since 1982 [definitions and protocols have remained the same], and
- quality assurance and statistical procedures are designed/developed to ensure that trend data are scientifically legitimate and unambiguous.

Irrespective of the scale of analysis, margins of error must be considered. Margins of error are presented for all NRI estimates. ■

Acres of Highly Erodible Cropland by Year in Millions of Acres, with Margins of Error

Year	< T	> T	Total
1982	41.0 ± 1.7	82.9 ± 1.9	123.9 ± 2.5
1987	38.1 ± 1.6	78.0 ± 1.9	116.1 ± 2.6
1992	41.6 ± 1.8	63.1 ± 1.8	104.7 ± 2.5
1997	45.9 ± 1.8	57.2 ± 1.6	103.1 ± 2.5
2001	46.0 ± 1.8	55.1 ± 1.7	101.1 ± 2.5

Acres of Non-Highly Erodible Cropland by Year in Millions of Acres, with Margins of Error

Year	< T	> T	Total
1982	209.5 ± 3.4	87.1 ± 2.0	296.6 ± 3.9
1987	209.2 ± 3.4	80.8 ± 1.9	290.0 ± 3.9
1992	221.0 ± 3.6	56.0 ± 1.6	277.0 ± 3.9
1997	222.8 ± 3.6	50.4 ± 1.5	273.2 ± 3.9
2001	219.9 ± 3.6	48.7 ± 1.5	268.6 ± 3.9

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